



# MOTIVATIONS

- COVID-19: disrupting daily life and work
- Twitter: social platform for opinions
- 62.5 million Twitter users in the United States
- Sentiment: people's attitude toward COVID-19
- Potential Topics: Health, safety, economics, social distancing, and school reopenings

# TWITTER DATA

- Twitter API: 8 days of data (Aug 08 to Aug 15)
- Limited to 5000 tweets per day related to COVID-19: English, within United States
- Search key words:


*corona, #corona, coronavirus, #coronavirus, covid, #covid, covid19, #covid-19, sarscov2, #sarscov2, sars cov2, sars cov 2, covid\_19, #covid\_19, #ncov, ncov, #ncov2019, ncov2019, 2019-ncov, #2019-ncov, pandemic, #pandemic, #2019ncov, 2019ncov*







- A total of 40K Tweets


*Full tweet text and geo information*




# A SNAPSHOT FOR A TWEET



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-  Bookmarks
-  Lists

 Tweet








**Justin (FroYo'g Softserve 🍌 if you're Scoopy)**  
@FroyogSoftserve

Back in March, the day before I was due to get a filling, I busted a tooth on a cheezit. Extra toasty. Because of COVID, the dentist office was closed. Today, I went to get that filling, and now I'm getting a crown. FFS, FLOSS CHILDREN!


7:59 PM · Aug 14, 2020 from Brooklyn, OH · Twitter for Android

10 Likes



 Search Twitter

**Relevant people**



**Justin (FroYo'g Softs...**  
@FroyogSoftserve [Follow](#)


Eldritch being from non-Euclidian area of Ohio. Scoop. Wavelength on the autism spectrum. I dig atheism, fellow Scoops, and Shock Monkeys. Tweets/views=my own.

**What's happening**

US election · 1 hour ago

**Trump campaign releases list of speakers for the RNC**

Trending with: [The Honorable](#) and [Ivanka Trump](#)



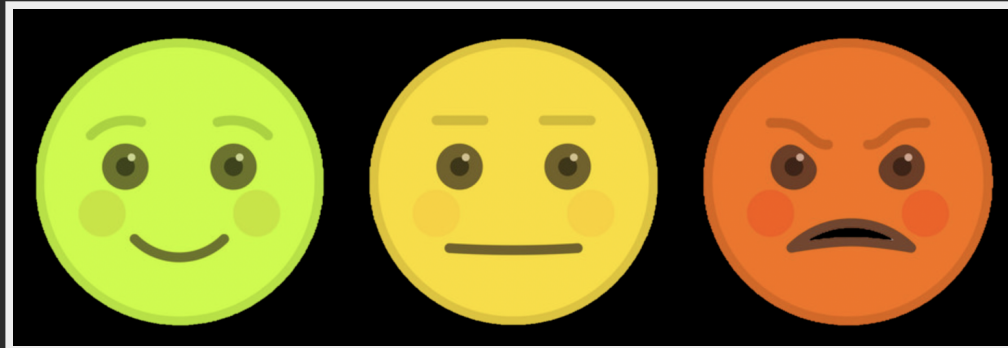
# A SNAPSHOT FOR A TWEET

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'in_reply_to_screen_name': None,
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# A SNAPSHOT FOR A TWEET

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[-81.7697, 41.462537]]]}},
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# SENTIMENT ANALYSIS



# SENTIMENT ANALYSIS

- Sentiment analysis:

*The process of 'computationally' determining whether a piece of writing is positive, negative or neutral. It's also known as opinion mining.*

- TextBlob

*TextBlob is a Python library for processing textual data. It can be used for natural language processing (NLP) tasks such as part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more.*



# SENTIMENT EXAMPLES

1	@greggutfeld Quit trying to be the mask police and you won't be assaulted or cussed out when I see someone with no mask I just turn and walk a different direction doing my social distancing Which I do anyway pandemic or not
-1	Sources: College Football "Is Done" Due To COVID-19 Concerns <a href="https://t.co/UNCgN58RjX">https://t.co/UNCgN58RjX</a> via @TheSportsOnTap
-1	@GOP @realDonaldTrump Biden would have had COVID under control by now, had real medicine to help the sick and wouldn't be making phony promises about a vaccine.
1	@StCthrin For the first part of the Covid shutdowns, I made a different cocktail practically every day. Basically a pro now, thanks corona.
0	@CBSNews Screw Pelosi, it's always about Her , last Stimulus Democrats gave themselves \$38,000 Raise ➡ Which Had Nothing to Do with The Coronavirus to Help The American People!! 🤔
1	I have followed this gentleman for the past several weeks. With family in #SouthDakota it would be great if @govkristinoem focused on her state as much as Jim does. So grateful to be in #Colorado and the way @GovofCO has been handling the pandemic. #WearAMask #DoingMyPartCO <a href="https://t.co/1o8w48NlqF">https://t.co/1o8w48NlqF</a>
0	Solution - funding from Congress. Limiting overtime during a pandemic when the health of voters is at risk- is helpful to the man not wanting D to vote by mail. Voter suppression!! <a href="https://t.co/Mi37AebdkE">https://t.co/Mi37AebdkE</a>
-1	@mrkyl @MyCharlestonPad @RVAT2020 @JABaloney But I didn't think he deserved all the hate he was getting—much more rightly directed at the GOP for exploiting a guy who is clearly out of his mind. \n\nIt's a serious medical condition. Do you not treat someone with Covid because they're a selfish jerk? It's the same.
-1	@Brandonreeves3 Brandon stop spreading fear! Be a part of the solution, not a nuisance! COVID is bad for some people. But so is the flu, pneumonia, etc. for those people, as well! #FactsMatter

# NATURAL LANGUAGE PROCESSING (NLP)

- Cleaning and pre-processing:
  - Stopwords removed
  - All words lower cases
  - All sepcial characters removed: "\"|\.|\?|\!|\,|\-|\\_|\(|\)|\{|\}|\||\=|\+|\:|\"
  - Splitted and stemmed



# NLP CONTINUED

- Splitted and stemmed (example):

*Before: "You really can't make this stuff up. As Columbia County suffers a #COVID19 spike due to golfing events. Sen. Jordan shows us just what those events looked like by attending a political golf event in Easton with NO MASKS and NO SOCIAL DISTANCING. #NewYork #MaskUp <https://t.co/zeOe511KdM>"*

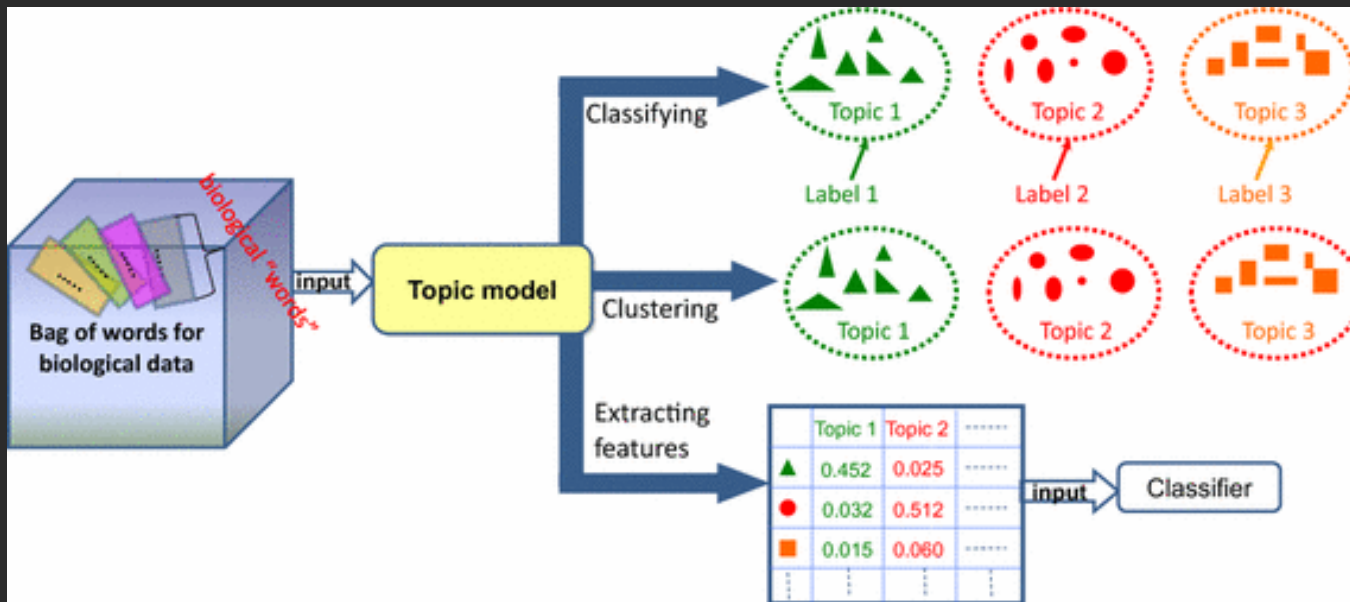
*After: "realli can't make stuff columbia counti suffer #covid19 spike due golf event sen jordan show us event look like attend polit golf event easton mask social distanc #newyork #maskup [http co zeoe511kdm](http://co.zeoe511kdm)"*

- Final words count: >70K (18k words showed up more than once)

# MACHINE LEARNING

- Machine Learning
  - *Top 400 words were seleted and 140 words were mannually removed (e.g. he, did, go, yo, yeserday, etc). Final key words: 260*
  - Latent Dirichlet Allocation (LDA): Unsupervised learning for clusterings/topics
  - Grid search:  $n = 2$  clusterings
  - From 2 up to 8 clusterings: human choice of 5 clusterings

# LDA MODEL EXPLAINED



# MACHINE LEARNING CONTINUED

- 5 Clusterings

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- 5 Clusterings

*School\_reopening (n=8557): school play football back week season colleg kid player sport cancel fall team game health risk plan check children high concern big athlet year take wonder free open reopen confer*

# MACHINE LEARNING CONTINUED

- 5 Clusterings

*School\_reopening (n=8557): school play footbal back week season colleg kid player sport cancel fall team game health risk plan check children high concern big athlet year take wonder free open reopen confer*

*2020\_Election (n=7945): trump realdonaldtrump american vote respons peopl presid elect america kill countri mail help state million think unemploy relief world money economi order call democrat gop take biden lie fund hous*



# MACHINE LEARNING CONTINUED

- 5 Clusterings

*School\_reopening (n=8557): school play footbal back week season colleg kid player sport cancel fall team game health risk plan check children high concern big athlet year take wonder free open reopen confer*

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*State\_News\_Economy (n=7184): test new time case death posit state thank today well number report job work amp result rate first back florida hospit quarantin neg*

# MACHINE LEARNING CONTINUED

- 5 Clusterings

*School\_reopening (n=8557): school play footbal back week season colleg kid player sport cancel fall team game health risk plan check children high concern big athlet year take wonder free open reopen confer*

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*State\_News\_Economy (n=7184): test new time case death posit state thank today well number report job work amp result rate first back florida hospit quarantin neg*

*Policies\_Mask\_Safty (n=8650): amp like mask peopl wear feel social student commun work spread safe help real everyon post love distanc put great famili face*

# MACHINE LEARNING CONTINUED

- 5 Clusterings

*School\_reopening (n=8557): school play footbal back week season colleg kid player sport cancel fall team game health risk plan check children high concern big athlet year take wonder free open reopen confer*

*2020\_Election (n=7945): trump realdonaldtrump american vote respons peopl presid elect america kill countri mail help state million think unemploy relief world money economi order call democrat gop take biden lie fund hous*

*State\_News\_Economy (n=7184): test new time case death posit state thank today well number report job work amp result rate first back florida hospit quarantin neg*

*Policies\_Mask\_Safty (n=8650): amp like mask peopl wear feel social student commun work spread safe help real everyon post love distanc put great famili face*

*General\_Critics (n=7664): die peopl month year vaccin fuck home live shit good take pleas sick work life mani busi flu last first right stop kid think patient care immun*

# RESULTS



Sign in to Tableau Online

# FUTURE DIRECTIONS

- COVID-19 and cancer patients
- Cancer and financial hardship
- Historical data
- Model improvements
- Looking for future updates? Click on: [Twitter Sentiment](#)

# HELP US FIGHT CANCER

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# QUESTIONS AND COMMENTS